

WHAT IS CLAIMED IS:

1. A computer system comprising:
  - 5 a first ring configured to communicate frames among at least two modules coupled to said first ring;
  - a second ring; and
- 10 a first bridge module coupled to said first ring and to said second ring, wherein said first bridge module is configured to transmit a first frame received from said first ring to said second ring if a first address within said first frame indicates a destination external to said first ring, and wherein said first bridge module is configured to transmit a second frame received from said second ring upon said first ring if a second address within said second frame indicates one of said at least two modules coupled to said first ring, and wherein said first ring and said second ring both employ a particular protocol for transmitting frames.
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- 25 2. The computer system as recited in claim 1 wherein said first ring comprises a first optical link coupled between one of said at least two modules and said first bridge module and a second optical link coupled between another one of said at least two modules and said first bridge module.
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3. The computer system as recited in claim 2 wherein said second ring comprises a plurality of optical links, and

wherein at least one of said plurality of optical links is coupled to said bridge module.

4. The computer system as recited in claim 1 wherein said  
5 protocol comprises time division multiplexing in which a first ring transit time corresponding to said first ring is divided into a first plurality of time slots.

10 5. The computer system as recited in claim 4 wherein each of said first plurality of time slots is capable of --  
transmitting one frame.

15 6. The computer system as recited in claim 4 wherein each of said first plurality of time slots is assigned to an owner, and wherein said owner is either one of said at least two modules or said first bridge module.

20 7. The computer system as recited in claim 6 wherein a second ring transit time corresponding to said second ring is divided into a second plurality of time slots, and wherein a length of each of said second plurality of time slots is equal to a length of each of said first plurality of time slots.

25 8. The computer system as recited in claim 6 wherein said owner of a first one of said first plurality of time slots is configured to allow another module to use said first one of said first plurality of time slots by marking said first one of said first plurality of time slots not owned.

30 9. The computer system as recited in claim 8 wherein said owner of said first one of said first plurality of time

slots is further configured to reclaim said first one of said first plurality of time slots as owned.

10. The computer system as recited in claim 9 wherein said  
5 owner of said first one of said first plurality of time slots is configured to use said first one of said first plurality of time slots upon receiving a null frame within said first one of said first plurality of time slots.

10 11. The computer system as recited in claim 8 wherein a return address within a third frame transmitted within said first one of said first plurality of time slots identifies which module coupled to said first ring is a source of said third frame.

15 12. The computer system as recited in claim 1 further comprising a third ring and a second bridge module coupled to said second ring and to said third ring.

20 13. The computer system as recited in claim 12 wherein said computer system is configured to perform a chain transaction between said first ring and said third ring, wherein said chain transaction comprises a plurality of frames.

25 14. The computer system as recited in claim 13 wherein said first bridge module, upon receipt of a first one of said plurality of frames upon said first ring, is configured to transmit said first one of said plurality of frames upon said second ring and to record a first return address of a sender of said first one of said plurality of frames, and wherein said sender resides upon said first ring.

15. The computer system as recited in claim 14 wherein said first bridge module is configured to replace said first return address within said first one of said plurality of frames with a second return address, and wherein said second 5 return address identifies said first bridge module upon said second ring.

16. The computer system as recited in claim 15 wherein said second bridge module is configured to determine that said 10 first one of said plurality of frames identifies a module upon said third ring, and wherein said second bridge module is configured to record said second return address and to transmit said first one of said plurality of frames upon said third ring.

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17. The computer system as recited in claim 16 wherein said first bridge module and said second bridge module are configured to accept a particular frame identified as a chain frame only if said particular frame is one of said 20 plurality of frames until each of said plurality of frames have been transmitted.

18. The computer system as recited in claim 17 wherein said first bridge module identifies remaining ones of said 25 plurality of frames using said first return address. -

19. The computer system as recited in claim 17 wherein said second bridge module identifies remaining ones of said plurality of frames using said second return address.

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20. A computer system comprising:

a ring configured to transmit frames between a plurality of modules coupled to said ring; and

5 a first module within said plurality of modules coupled to said ring;

wherein a ring transit time corresponding to said ring is divided into a plurality of time slots, and wherein each of said plurality of time slots is capable of carrying a  
10 frame, and wherein a first time slot within said plurality of time slots is assigned to said first module, and wherein said first module is configured to allow a different one of said plurality of modules to use said first time slot by marking a first frame within said first time slot not owned,  
15 and wherein said first frame includes a return address which identifies which one of said plurality of modules is a source of said first frame.

21. The computer system as recited in claim 20 wherein said  
20 first module is further configured to reclaim said first time slot by marking said time slot owned.

22. The computer system as recited in claim 21 wherein said one of said plurality of modules which is a source of said  
25 first frame is configured to acknowledge said first module reclaiming said first time slot by transmitting a null frame in said first time slot.

23. The computer system as recited in claim 22 wherein said first module is configured to use said first time slot upon  
30 receiving said null frame.

24. A computer system comprising:

a first ring configured to communicate frames between a  
first plurality of modules coupled to said first  
ring;

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a second ring configured to communicate frames between  
a second plurality of modules coupled to said  
second ring;

10  
a third ring;

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a first bridge module coupled between said first ring  
and said third ring and a second bridge module  
coupled between said second ring and said third  
ring, wherein said first bridge module and said  
second bridge module are configured to perform a  
first chain transaction comprising a plurality of  
frames, wherein said first chain transaction is  
performed between said first ring and said second  
ring, and wherein said first bridge module is  
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configured to receive a first one of said  
plurality of frames from one of said first  
plurality of modules and to record a first return  
address from said first one of said plurality of  
frames, and wherein said first return address  
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identifies said one of said first plurality of  
modules within said first ring, and wherein said  
first bridge module is configured transmit said  
first one of said plurality of frames upon said  
third ring after replacing said first return  
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address with a second return address identifying

5           said first bridge module, and wherein said second bridge module is configured to record said second return address whereby remaining ones of said plurality of frames are identified by said second bridge module.

25. The computer system as recited in claim 24 wherein said first bridge module is configured to receive a particular frame indicating a second chain transaction upon said first ring, and wherein said particular frame is sourced from a different one of said first plurality of modules, and wherein said first bridge module is configured to retransmit said particular transaction upon said first ring if said first chain transaction is incomplete.

15           26. The computer system as recited in claim 25 wherein said second bridge module is configured to receive a second particular frame indicating a third chain transaction upon said second ring, and wherein said second particular frame is sourced from a different one of said second plurality of modules, and wherein said second bridge is configured to retransmit said second particular transaction upon said second ring if said first chain transaction is incomplete.